

REMARKS

Applicants have amended their claims in order to further clarify the definition of various aspects of the present invention. Specifically, Applicants have amended claims 4, 5 and 8 to recite a “railway car”. Applicants have further amended claim 6 to recite that the face of the one side of the abutted portion is supported by “a bed”; and have amended claims 7 and 8 to recite that the face of the opposite side (to the one side at which the friction stir welding was carried out) is an outer “surface” of the structure body (railway car).

With respect to present amendments to the claims to recite a bed, note, for example, the paragraph bridging pages 4 and 5, and Fig. 10 and the description in connection therewith in the first full paragraph on page 12, of Applicants' specification. With respect to recitation of the railway car, note, e.g., Fig. 15 and the discussion in connection therewith in the first paragraph on page 15 of Applicants' specification, as well as comments by the Examiner in the last paragraph on page 2 of the Office Action mailed April 1, 2005. In connection with reference to the outer surface of the structure body or railway car, note, for example, the paragraph bridging pages 10 and 11 of Applicants' specification.

Applicants respectfully traverse the rejection of claims 1-6 and 8 under the first paragraph of 35 USC 112, as set forth on page 2 of the Office Action mailed April 1, 2005, particularly insofar as this rejection is applicable to the claims as presently amended. Thus, Applicants have amended their claims to recite a bed, rather than a backing plate. Clearly, such bed is described in the original application, e.g., note Fig. 10 and the description in connection therewith in the first paragraph on page 12 of Applicants' specification. Note also Figs. 9(A)-(D) and the description in connection therewith on pages 10 and 11 of Applicants' specification,

particularly the description bridging pages 10 and 11 thereof. Note also the paragraph bridging pages 4 and 5 of Applicants' specification. As can be seen in the listed portions of Applicants' specification, there is a clear description of the "bed" backing the members which are friction stir welded, so as to satisfy the requirements of the first paragraph of 35 USC 112.

Applicants have amended their claims to recite a railway car, rather than a "vehicle". Noting especially the last two lines on page 2 of the Office Action mailed April 1, 2005, clearly, in view of the present amendments, the rejection of claims based upon recitation of "vehicle" in the claims is moot.

It is respectfully submitted that claims 7 and 8 patentably distinguish over the teachings of the references applied by the Examiner in rejecting claims 7 and 8 in the Office Action mailed April 1, 2005, that is, the teachings of the U.S. Patents to Childress, No. 5,862,975, and to Thomas, et al., No. 5,460,317, International (PCT) Publication No. WO95/26254 (Midling), and the publications The 2nd International Forum on Aluminum Ships (November 1995), Dawes, "An Introduction to Friction Stir Welding and its Development", in Welding & Metal Fabrication (January 1995), pages 13-16, and Bulletin 6 of the TIWI-World Centre for Materials Joining Technology, Vol. 36, (November/December 1995), pages 124-127, under the provisions of 35 USC 103.

It is respectfully submitted that these references as applied by the Examiner would have neither taught nor would have suggested such a structure body, or such a railway car, as in the present claims, having first and second plates welded to each other from one side of a thickness direction, by friction stir welding, and with a face of the opposite side to the one side being an outer surface of the structure body or of the railway car. See claims 7 and 8.

By having the face of the structure, opposite to the face upon which the friction stir welding is performed, being the outer (e.g., exposed) surface of the structure body or railway car, a body having an exposed surface which is flat and has a good appearance, yet forming part of a body having a strong weld, can be achieved.

Midling discloses a method of friction stir welding based on a relative rubbing movement between a probe of harder material and members to be joined, the friction stir welding utilizing a non-consumable probe that is provided with a concave bottom part and an interchangeable pin having a surface of threaded configuration. The welded product is displayed schematically in Figs. 5a-e, which show different types of welds provided by the method and probes. Note also the paragraph bridging pages 5 and 6 of Midling.

It is respectfully submitted that in connection with the welded structures shown by Midling, no indication is made as to outer and inner faces. It is respectfully submitted that Midling would have neither disclosed nor would have suggested such structure body or such railway car as in the present claims, wherein the face of the side opposed to the one side at which the friction stir welding takes place, is arranged as an outer surface of the structure body or railway car.

The contention by the Examiner in the first full paragraph on page 4 of the Office Action mailed April 1, 2005, that the outer face of the structure body is relative to the direction in which the body is being viewed and does not structurally limit the article, is respectfully traversed. Note that the "structure body", which can, for example, be a building or railway car, having an inside and outside, would have had an outer surface located (exposed) to the outside, and it is respectfully submitted that the outer surface as in the present claims clearly has a definite meaning in the

art and further structurally defines the article.

In particular, attention is particularly directed to claim 8, reciting a railway car, with claim 8 reciting that the face of the side opposed to the one side is arranged as an outer surface of said railway car. It is respectfully submitted that such outer surface of the railway car further structurally defines the surface (as can be seen in Fig. 15), which must be considered in determining patentability.

As can be seen in the foregoing, and as will be seen throughout the rest of these remarks in connection with the other applied references, it is respectfully submitted that these references would have neither disclosed nor would have suggested such structure wherein the specified face opposed to the one side is arranged as an outer surface of the structure body (railway car), and advantages achieved thereby.

The contention by the Examiner that Applicants have failed to establish a frame of reference for the outer face, is respectfully traversed, particularly in light of the presently amended claims. Thus, the claims recite an outer surface, again noting disclosure of, e.g., railway cars and buildings. It is respectfully submitted that such outer surface has a definite meaning, particularly with respect to the railway car, and that the claims establish a frame of reference therefor.

The Examiner has taken a same position with respect to each of the other applied references; that is, that the outer face of the structural body is relative to the direction in which the body is being viewed and does not structurally limit the article.

To the contrary, it is respectfully submitted that the outer surface has a structural meaning; and as will be shown in the following, it is respectfully submitted that none of the remaining applied references would have taught or would have suggested such outer surface being the face opposed to that from which the friction stir welding

takes place, and advantages thereof.

Thomas, et al. discloses a friction stir welding for joining two workpieces or for operating on a workpiece. Welded structure is shown in, e.g., Fig. 1, wherein a pair of aluminum alloy plates 1A, 1B are butted together about a joint line 2. See column 3, lines 62 and 63. Note also the paragraph bridging columns 1 and 2; and column 2, lines 10-13, 23-25, and 34-43, of Thomas, et al. This patent discloses various examples, and states that in all of the examples, the result of the welding operation is an extremely smooth finish on the surfaces of the plates which is a particular advantage of the process. See column 9, lines 21-25.

As seen in Fig. 1 of Thomas, et al., the weld is shown, without an indication as to the body (e.g., a railway car) formed using the welded structure, and clearly without showing an outer surface of the structure body (railway car). It is respectfully submitted that the disclosure of this reference would have taught away from the present claims, including the outer surface with respect to the side subjected to the friction stir welding, as in the present claims.

The 2nd International Forum on Aluminum Ships discloses, in Fig. 4, a general view of a friction stir weld in 5083 alloy, describing that the joint quality is excellent and the "weld" is difficult to differentiate from parent material, even after prolonged etching.

This Fig. 4 is a general view of the weld, and it is respectfully submitted that the disclosure in connection therewith would have neither described nor would have suggested the presently claimed structure body or vehicle, having the specified face as the outer surface of the structure body (railway car) and advantages thereof.

The article from Welding & Metal Fabrication describes friction stir welding; and, in Fig. 1, shows two extruded, 6000 series, aluminum alloy panels

autogenously friction stir welded together with very low distortion.

Childress shows a structural double-lap shear joint for attaching fiber-reinforced composite structures, especially graphite/epoxy laminates, to metal structures using metal Z-pins that extend through the composite structure and that are welded to the metal, the structural double-lap shear joint joining two metal tangs sandwiching the composite with a plurality of metal Z-pins that extend through the composite and that are welded to the tangs using resistance, laser, friction stir or another suitable welding process. See column 1, lines 6-10 and column 2, lines 39-43. Note also the paragraph bridging columns 2 and 3.

Bulletin 6 introduces the basic principal of friction stir welding, pointing out the practical advantages and disadvantages. This article discloses that the weld comprises a continuous consolidated nugget of forged material with a much refined grain size; and that the elliptical rings in the weld metal, seen in Fig. 3 of the article, are a product of the welding tool profile and forward movement per revolution in relation to the temperature gradient throughout the depth of the weld. Note also Fig. 2, showing schematically a perspective view of the welded structure; compare with Fig. 1 of Thomas, et al.

It is respectfully submitted that the article from the Welding & Metal Fabrication, Childress and the article in Bulletin 6 provide general views of the formed weld; and it is respectfully submitted that these references do not disclose, nor would have suggested, specifics of structural bodies formed, including wherein the face of the side opposed to this one side from which friction stir welding is performed is arranged as an outer surface of the structure body, and advantages thereof.

It is respectfully submitted that in the field of welding, generally a face at a

side of the weld where the welding tool was positioned, is formed as the outer surface of the structure body. It is respectfully submitted that this is opposite to the presently claimed structure, wherein the face of the side opposed to the one side at which the friction stir welding is formed, is arranged as an outer surface of the structure body (railway car). It is respectfully submitted that the general teachings in various of the applied references would have taught away from the present invention, to one of ordinary skill in the relevant art.

The contention by the Examiner on page 9 of the Office Action mailed April 1, 2005, that the outer face the structural body is relative to the direction in which the body is being viewed, is noted. It is emphasized that the present claims recite the outer surface, of the structure body, thereby providing a frame of reference.

The analogy set forth by the Examiner, with respect to a structural body sitting upright from the ground and not connected to anything, set forth in the third paragraph on page 9 of the Office Action mailed April 1, 2005, is noted. With respect to the present claims, which recite an outer surface, clearly the recitation of an outer surface has meaning as a structural limitation of the article, that is, a surface facing the outside. This would be especially true for a railway car, and the outer surface thereof; in connection therewith, any contention by the Examiner as to a structure body "sitting upright from the ground and is not connected to anything" is not understood. With respect to the structural body, it is respectfully submitted that the "outer surface" has a definite meaning, particularly with respect to the structural body as described in the present disclosure (e.g., a building), so as to further structurally define the body. Especially in light of the presently claimed subject matter, including the outer surface, it is respectfully submitted that the teachings of the applied prior art would have neither disclosed nor would have suggested the

presently claimed invention.

In view of the foregoing comments and amendments, reconsideration and allowance of all of the claims presently in the application are respectfully requested.

Applicants request any shortage of fees due in connection with the filing of this paper be charged to the Deposit Account of Antonelli, Terry, Stout & Kraus, LLP, Deposit Account No. 01-2135 (case 503.35255VX1), and credit any excess payment of fees to such Deposit Account.

Respectfully submitted,

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